GEOGRAPHICAL RECORD.

AMERICAN GEOGRAPHICAL SOCIETY.

TRANSACTIONS OF THE SOCIETY, JANUARY, 1905.—The Annual Meeting of the Society was held at Mendelssohn Hall, No. 119 West Fortieth Street, on Tuesday, January 24, at 8.30 o'clock P.M.

President Peary in the chair.

The following persons, recommended by the Council, were elected Fellows:

J. Parke Channing.
Henry Parish, Jr.
Arthur E. Stillwell.
George Crile, M.D.
Dr. Titus Munson Coan.
James Morris.
James Jesse Atkinson.
William S. Day.
Joseph Peabody.
Abram S. Post.
Edward L. Rogers.
Clifford S. Griswold.
Charles M. Schott, Jr.
James Mills Peirce.
Samuel Sachs.
Gardiner Sherman.
C. Stuart Gager.
Dr. Richard B. Coutant.
August R. Meyer.
Richard T. Dana.
M. J. Butler.
Mrs. John Wells.
John Byron Goldsborough.
Robert E. Plumb.
Franklin R. Carpenter.
Ralph G. Packard, Jr.
George St. John Sheffield.
Dr. Warren O. Plimpton.
Mrs. John D. Hewletts.
Joshua T. Jones.
Mrs. Bashford Dean.

The Annual Report of the Council was then submitted and read.

NEW YORK, Jan'y 12, 1905.

To the American Geographical Society:

The Council respectfully submit the following report for the year 1904:

The number of Fellows on the 1st of January was 1,240. The additions during the year were 108. The losses by death, resignation, etc., were 83, and the total Fellowship on the 31st of December was 1,265, of which number 364 were Life Fellows.

The additions to the Library number 4,293—Periodicals and Pamphlets, 2,944; Books, 742; Maps and Charts, 526; Atlases, 25; Photographs and Prints, 56.

Six regular Meetings of the Society were held:

On the 19th of January Mr. Robert Lansing addressed the Society on the Questions Settled by the Award of the Alaskan Boundary Tribunal;

On the 23d of February the Rev. Putnam Cady delivered an address on the Physical and Historical Geography of the Dead Sea Region;

On the 15th of March Prof. Wm. M. Davis described his Journey in Turkestan;

On the 19th of April Dr. Edmund O. Hovey told the incidents of a Journey in Southern Russia and the Caucasus Mountains;

On the 22d of November Mr. Oscar T. Crosby addressed the Society on a Journey in Turkestan and a Corner of Tibet;

On the 20th of December Mr. Alfred H. Brooks described the Geography and Resources of Alaska.

There have been published in the BULLETIN, besides the Record and the Scientific Notes, twenty-four original papers.

For the condition of the finances reference is respectfully made to the report of the Treasurer, herewith presented.

As indicated in the last Annual Report, the Society acceded to the request of the Managers of the Eighth International Geographic Congress to conduct meetings in New York on the 13th, 14th and 15th of September.

All the foreign representatives were the guests of the Society, which provided their transportation from Washington and their hotel accommodation in New York.

During the three days the Society's house was thrown open to the members of the Congress, and all the General Sessions were held in our Assembly Hall; but the house being too small to afford space for many simultaneous meetings, appeal was made to the American Museum of Natural History, which, with great generosity, not only offered the use of several rooms for the reading of papers, for reporters, smoking, etc., but invited all the members of the Congress to a luncheon on the 14th of September.

On the evening of September 13 a reception was held in the Society's house, and on the 14th the Society gave a dinner complimentary to the foreign guests at the Hotel Endicott. At the dinner M. Cordier delivered to President Peary the gold medal awarded to him by the Société de Géographie, of Paris.

At the request of the Society an exhibition of rare maps, admirably arranged in chronological order, was freely opened to the Congress by the authorities of the Lenox Library.

The 15th of September was devoted to an excursion on the Hudson River as far as Fishkill, organized and conducted by the Society for the Fellows and the members of the Congress. On the return from Fishkill the party stopped at West Point to accept the hospitality of Brig.-Gen. Mills, Superintendent of the U. S. Military Academy.

The funds of the Society were not drawn upon for the entertainment of the Congress. All expenses growing out of the meetings in New York were paid by voluntary contributions from members of the Council and Fellows of the Society.

In commemoration of the fiftieth anniversary of the incorporation of the Society, a dinner was given at Delmonico's restaurant on the 21st of December.

All of which is respectfully submitted.

HENRY PARISH,
Chairman.

LEVI HOLBROOK,
Secretary.

The report of the Treasurer was then read:

Report of the Treasurer to the American Geographical Society for the year 1904:

GENERAL ACCOUNT:

The Treasurer respectfully reports:

On January 1st there was on hand a cash balance of		$64.58
During the year there have been received for Fellowship Dues, Sales of Publications, Interest on Investments, etc.	$20,238.25	
Mortgage Investment paid off	500.00	
Legacies	3,165.33	23,903.58
		$23,968.16

There have been expended for Salaries, Meetings, Library, Publications, House Expenses, Insurance, Postage, Furniture, etc., etc. $21,367.45

On December 31st there was on hand a cash balance of..... $2,600.71

Respectfully submitted,
WALTER R. T. JONES,
Treasurer.

The Committee charged with the duty of selecting candidates for the offices to be filled made the following report:

NEW YORK, December 8th, 1904.

To the Council of the American Geographical Society:

The Committee appointed to recommend to the Society suitable persons to be elected in January, 1905, to fill vacancies then existing in its offices, respectfully report that they recommend the election of the following-named persons to the offices below designated:

President—ROBERT E. PEARY (Term to expire in 1906).
Vice-President—C. C. TIFFANY (Term to expire in 1908).
Treasurer—WALTER R. T. JONES (Term to expire in 1906).
Domestic Corresponding Secretary } CHANDLER ROBBINS (Term to expire in 1908).
Councillors—GEORGE S. BOWDOIN,
CHARLES S. FAIRCHILD,
HENRY HOLT,
ARCHIBALD D. RUSSELL,
HERMAN C. VON POST, } (Terms to expire in 1908).

HENRY PARISH,
LEVI HOLBROOK,
F. M. BACON, } *Committee.*

The above report was read to the Council and approved, and the persons named are recommended to the Society for election.

On motion, duly seconded, Mr. A. A. Raven was authorised to cast the vote of the Society for the persons named, and they were declared duly elected.

President Peary then addressed the Society on the Geographical Work of the World in 1904. Stereopticon views were shown.

On motion, the Society adjourned.

Mr. H. L. Bridgman, who left New York at the end of December, 1904, on a mission to the Congo Free State, writes to President Peary from the Grand Hotel, Khartum, on the 13th of January, as follows:

The Congo "special" arrived on time this morning, and having hired "boys" and donkeys and purchased outfit, is now ready to leave Sunday afternoon for Lado, 1050 miles by steamer up the Nile, where its real work will begin Jan. 28. I am taking supplies for 56 days, though I shall hope to do the actual marching in less time. I'll try to send back a line from Lado; after that I shall, of course, keep ahead of any letters. . .

AMERICA.

IRRIGATION IN THE UNITED STATES IN 1902.—*Bulletin* 16 of the Census Bureau is devoted to this subject. It describes the wonderful transformation in the past twenty years in many parts of the arid West, where thousands of miles of canals

carry water to more than 8,000,000 acres. This land, at one time a worthless desert, is now annually producing crops worth $100,000,000. A crop-producing area larger than the combined area of Massachusetts and Connecticut has been developed in this once forbidding region. The following facts, showing conditions in 1902, are condensed from Table 1:

	NUMBER OF FARMS IRRIGATED.	NUMBER OF ACRES IRRIGATED.	COST OF SYSTEMS.
Arid States and Territories	122,156	8,471,641	$77,430,212
Semi-arid States and Territories	7,021	403,449	5,105,390
Rice States	4,179	606,199	10,195,992
Humid States	680	5,788	588,858
United States	134,036	9,487,077	$93,320,452

The average cost per irrigated acre was: arid States and Territories, $9.14; semi-arid States and Territories, $12.65; rice States, $16.82; humid States, $101.74; United States, $9.84.

THE SUBMARINE GREAT CAÑON OF THE HUDSON RIVER.—The paper on this subject, which Dr. J. W. Spencer of Washington read before the American Association for the Advancement of Science in Philadelphia, is printed in the *American Journal of Science* (Jan., 1905). Prof. J. D. Dana was the first to recognize, more than forty years ago, the depression extending from near New York to the border of the Continental shelf which the Coast Survey had brought to light as the submerged channel of the Hudson River, formed when the continent stood at a greater altitude above the sea than it does now. The channel begins about ten miles off Sandy Hook, and extends for 93 statute miles before it plunges into the Cañon. Dr. Spencer describes his investigations and studies and those of Lindenkohl, Upham and others, and presents the following summary of his paper and his conclusion:

In 1885, Prof. A. Lindenkohl discovered the channel suddenly transformed into a canyon near the continental border, reaching to a depth of 2,400 feet below the surface of the submerged plain, which is about 400 feet beneath sea-level. But near the then known mouth there appeared a great bar. In 1897, I pointed out that the channel was traceable to great depths, which is now proved. A sounding was made near the supposed bar, which has proved to be only a measurement, taken on the side of a deep canyon with a precipitous wall. Then, four miles beyond this point, against another lateral bank, a further sounding reaches to 4,800 feet, revealing a canyon 3,800 feet in depth, where the continental shelf is not submerged more than 1,000 feet. High up on the sides, the gorge here is less than two miles wide; but the incision of the outer canyon into the shelf has a breadth of four miles. At its head, the canyon begins in an amphitheatre, having a descent from 330 feet to 1,100 feet in the distance of about a mile. Two more steps of 400 and 500 feet respectively follow. Again, between 27 and 31 miles below its head, there is another great step of 2,000 feet to the depth of 4,800 feet mentioned. And the gradient below is probably by other great steps.

This is just beyond the border of the submarine plain, and shows the canyon with a depth of 3,800 feet. The canyon is double, a second or more sinuous gorge traverses the other. A little farther on is a tributary heading in a cove. At 42 miles the canyon begins to widen into a valley, which at 48 miles has a precipitous wall of 2,000 feet in height. The valley opens into an embayment, or wider valley, which also receives that from the Connecticut, now discovered to a depth of about 6,000 feet for the first time, but without details to describe its form. In cutting through the continental bench, at 3,000–3,500 feet beneath the sea-level, the floor of the canyon is between 6,000 and 7,000 feet below the surface of the ocean. The valley is continuous to a point 71 miles from the head of the gorge, and where it is recognizable at a depth of about 9,000 feet.

The canyon and valley discovered to the depth shown, incising first the level continental shelf (in which it turns twice at right angles), and then coursing down the great continental slope, is now taken as a gauge for measuring a late high continental elevation of the region to the extent of 9,000 feet.

This is following out the lines of Dana, Lindenkohl and other students of the submarine channel, in that they considered it a drowned land valley. I have analysed every other known possible cause of its origin. So great are the probabilities, and so long have these been accepted unquestioned, that very strong proof would be required to modify this view.

The period of the great elevation has been found to coincide with that of the early Pleistocene. Since then there has been a subsidence to somewhat below the present level, followed by a re-elevation of 250 feet as seen in the shallow channels of the shelf. With other minor changes, the region is now sinking at the rate of two feet a century.

This canyon feature at our door corroborates the great changes of level worked out most extensively by Hull of Britain, Nansen of Norway, and myself here and in the West Indies, following methods which the father of geography, Prof. J. P. Lesley, predicted in 1888 " must throw light on the whole subject of elevation and subsidence, as applicable to the entire area of the United States."

PRACTICAL GEOGRAPHY IN AMERICA.—At a meeting of the Geographical Association in England on Jan. 6, a discussion occurred on the teaching of practical geography in schools. Professor Charles R. Dryer, of the State Normal College, Terre Haute, Ind., opening the debate, said that practical geography meant in America laboratory work. This work is not necessarily done in a special room, and, indeed, the best part of it is done out of doors. The study of maps plays a large part in this laboratory work. Contoured topographical maps are also much used, together with raised models illustrating different forms of the earth's surface. Pictures, photographs, and lantern-slides also have a conspicuous place in the school's equipment. The instrumental study of the earth's atmosphere is taken next by the students, who keep records of their own observations for a period of three months. The official weather charts may be obtained daily at every school, and owing to the area covered by them it is possible to follow cyclonic and anti-cyclonic disturbances for several days together, and sometimes to predict in the school itself the arrival at a particular time of an atmospheric disturbance. Field excursions are regarded as the most important part of geographical study.

FINGER LAKE REGION OF WESTERN NEW YORK.—The westernmost members of the Finger Lakes—Canandaigua, Honeoye, Canadia, Hemlock, and Conesus—are described in a recent paper by Prof. Charles R. Dryer (Bull. Geol. Soc. Amer., Vol. XV, 1904, pp. 449–460). He shows that, like the more eastern members, Seneca, Cayuga, etc., these lakes are in long, narrow, deep and smooth-sided valleys. Some of the tributaries to these lake valleys are in valleys whose bottoms are hanging well above not only the lake bottoms, but even above the lake surface. In this respect, too, there is close resemblance to the conditions in the Cayuga and Seneca basins. One instance is described, that of the Canadia lake valley, in which the valley is hanging at both ends above Hemlock lake. From the evidence thus far discovered Dryer concludes that these valleys, which differ materially from normal stream valleys, are probably due to the erosive power of ice during the glacial period, and that the amount of deepening amounted to at least 400 feet. He states, however, that evidence recently discovered in the Cayuga and Seneca valleys, which opposes the theory of ice erosion, leaves the question of the origin of these peculiar valleys still in doubt. R. S. T.

RETIMBERING THE PINE LANDS OF MICHIGAN.—Last spring marked the beginning of reforestation work in the Michigan State Forest Reserve in Roscommon County. The plantation work consisted in the setting out of 30,000 white pine trees, 10,000 Scotch pine, and 10,000 Norway spruce. The planting was done at intervals of six feet, the ground being prepared by means of mattocks. Extensive seed beds were prepared for the raising of seedlings to be used in plantation work in 1906. The principal seedlings will be white pine, Norway spruce, and Scotch pine. The

Senior class in Forestry at the University of Michigan assisted in all the work. The people of the State are heartily in favour of the forestry policy now being carried out. —(*Forestry Quarterly*, Vol. II, No. 4.)

HEIGHTS OF MOUNTAINS IN THE CANADIAN ROCKIES.—Mr. A. O. Wheeler says, in *Appalachia* (Vol 10, No. 4), that maps which represent the height of some Canadian mountains as between 15,000 and 17,000 feet above sea-level greatly exaggerate. In 1902 the Rev. James Outram ascended a number of high peaks of the Canadian Rockies, and made observations to ascertain their altitude. Dr. Norman Collie and others from 1892 to 1902 made similar observations. The general result was a decided decrease in the previously-accepted altitude of several of the highest mountains of the main range.

While conducting a topographical survey of the Selkirk Range for the Canadian Government, employing the photo-topographic method, Mr. Wheeler took a number of views from commanding Selkirk peaks, in which Mounts Columbia, Bryce, Lyell, and Forbes were readily identified. He desired to ascertain what degree of reliability might be placed upon the computation of altitudes at the long distances shown in the photographs and so determined the altitude of Chancellor Peak by the method employed in photo-topographic surveys. This altitude had previously been computed by the Topographical Survey from a series of angular readings, and established at 10,780 feet above sea-level. He now computed the height of Chancellor Peak from four views taken at different stations, and the mean result, 10,751 feet, was 29 feet less than that previously established. The result seems to promise altitudes for the four northern peaks that would closely approximate the truth. The results of his computations were these mean altitudes for the four mountains:

Mount	Columbia	12,740	feet,	mean	of four	observations
"	Bryce	11,686	"	"	" six	"
"	Lyell	11,463	"	"	" four	"
"	Forbes	12,075	"	"	" four	"

EXPLORATION OF THE UPPER BASIN OF THE NETCHAKHOH.—The Rev. A. G. Morice, of the Missionary Station on Lake Stuart, British Columbia, has explored the large basin of the Upper Netchakhoh, an affluent of the Fraser River. His map and account of his explorations are printed in the *Bulletin* of the Neuchâtel Geographical Society (XV, 1904). He has rendered geographic service by his careful surveys in this little-known region, which extends between the Rocky Mountains and the coastal chain of the Pacific. A few geographical co-ordinates had been established by the Government, and upon these points Father Morice based the surveys of his itineraries. His numerous determinations of altitudes are the results of barometrical observations carried out at all the principal summits and the most important lakes. A number of soundings were made in most of the lakes visited, and at least one in all of them. Some of the lakes on the plateau or mountains are roughly circular in form and comparatively small, while the lakes of the valleys are much larger and very deep. Lake Morice, for example, is fifty-one miles long, and in this lake the explorer found the greatest depth of water (777 feet).

CUBA'S METEOROLOGICAL JOURNAL.—The Central Meteorological Station at Havana, under the control of the Secretary of Agriculture, Industry, and Commerce, prints a monthly *Boletín*, each number of which contains two charts, one showing the mean temperatures and the predominating winds of the month and the other the distribution and quantity of rainfall. These charts are preceded by a résumé of climatic conditions in the different provinces and monthly tables of meteorological observations.

AFRICA.

THE VICTORIA FALLS.—These falls, in the Zambezi River, about 1,000 miles from the coast, are remarkable for their width, height, and beauty, giving them rank among the greatest of the world's cataracts. Above the cataract the river flows almost on the surface of the plateau, branching in numerous arms between a series of islets. It then tumbles about 400 feet into a chasm and follows a peculiar zig-zag course into a cañon about 40 miles in length. The crest of the falls is not continuous but interrupted by three islands, which divide it into four falls of unequal width, the smallest 36 yards, the largest 573 yards broad. The rock, both at the crest of the falls and in the cañon, is a basalt, horizontally bedded, with some layers slightly less resistant than others, but with scarcely sufficient difference to account for the cataract, or the difference in resistance of the strata as in the case of Niagara.

Livingstone, who first discovered these falls, in 1860, ascribed them to fissuring of the crust, and all subsequent writers have accepted this explanation; but Molyneux, in a recent article (Geog. Journ., Vol. XXV, 1905, pp. 40–55), from which the above facts are taken, states a much more rational explanation, and supports it by a sufficient body of fact to lead to its acceptance. His explanation is that of simple river erosion, working irregularly, owing to the influence of the joint planes by which the basalt is traversed, in some places even to the extent of the development of basaltic columns. Taking advantage of the weakness resulting from areas of abundant joints the water works more rapidly in such places, and causes shifting of the form and position of the falls, which, however, continue to remain vertical, because the joints cleave the rock vertically. It is by following areas of abundant joints that the peculiar zig-zag course of the gorge below the falls is developed, and the author shows quite conclusively that portions of at least some of the zig-zags were the site of former falls during the process of upstream recession, which is still in progress.

Molyneux's discussion, which is illustrated by a map and nine full-page half tones, seems to explain the main features of the Victoria Falls, and, although there are some questions of detail which seem to call for explanation, will doubtless stand the test of future investigation. He makes some comparisons and contrasts with Niagara which the Victoria Falls rival in grandeur, and exceed in size. Had he been familiar with the Shoshone Falls, he would doubtless have found there some opportunities for more striking comparisons, though the Shoshone Falls are mere pigmies beside these giant falls. R. S. T.

ASIA.

EXPLORATION IN WESTERN TIBET.—On the return journey to India of the Tibetan Mission a small party under Captains Ryder and Rawling diverged from the main body for the purpose of ascending the valley of the Sangpo River in a general western direction, with a slight northing towards Gartok. This is one of the three marts to be opened for Indo-Tibetan trade under the provisions of the new treaty. It is 510 miles from Gyangtse, the other nearest Tibetan mart on the east and about 200 miles from Simla on the west. This part of Tibet has been practically unexplored. The party left Gyangtse on Oct. 10, and arrived at Shigatse in three days after a delightful journey through richly-cultivated and highly-irrigated valleys. Villages were dotted thickly over the slopes, every house and hamlet being surrounded with trees. The harvest had been good, and this part of Tibet was prosperous. The party were received in a most friendly manner by the Tibetan officials. Shigatse had not been seen by Europeans since Captain Turner's visit 120 years ago. The British officers describe the neighbouring monastery of Tashi-lhunpo as far finer than anything at Lhasa, its circumference being two miles. The monastery consists of

300 or 400 houses, besides temples and the palace of the Tashi Lama, who is at present, by virtue of the decree of the Emperor of China, the head of all the churches owning the supremacy of the Dalai Lama. The Tashi Lama received the Englishmen cordially. The party continued its long journey through the unexplored region toward Gartok, and the first news of its discoveries will probably come from Simla.

EUROPE.

DEPTHS OF THE NORTHERN FIORDS OF NORWAY.—Last summer Mr. Nordgaard made a series of soundings in the fiords of northern Norway which revealed unexpected depths at the entrances. These soundings along the coast between 67° 15′ and 68° 25′ showed the following results at or just within the mouths of the fiords:

Ofoten fiord, 550 meters; Ôsund, 630; Tys fiord, 725; Folden fiord, 530; Skjerstad fiord, 518. In Vest fiord, near Tranö, the soundings ranged from 630 to 680 meters. (*Naturen*, Bergen No. 12, 1904.)

CATALOGUE OF NORTHERN EUROPEAN FISH.—The International Council for the Exploration of the Sea has published in French at Copenhagen (*Publications de Circonstance*, No. 12) a catalogue of the fish observed in waters that are limited on the north by the Arctic Ocean, on the east by Novaya Zemlia, the Kara Sea and the Urals, on the south by the English Channel, and on the west by the east coast of Greenland, and further south by 25 W. Long. A. Günther's classification of fish, as prepared for the British Museum, is used, and not only the scientific names of the various subclasses, orders and families, but also the names by which the fish are known in the languages of North Europe are given. The catalogue also contains information on the nature of the waters that each fish frequents and its geographical distribution.

ATLANTIC WATER IN THE NORTH SEA.—The part assigned to Scottish hydrographers in the international scheme of Exploration of the Sea during 1903 related largely to the problem of the quantity of Atlantic water which flows in through the channels between Scotland and Shetland, and so enters the North Sea. The results are reported by Dr. A. J. Robertson, of Dundee (*Publications de Circonstance, No. 17*). Along the section from the North of Scotland to the Shetlands widely different conditions were found at the various seasons of the year. In May, 1903, the greater portion of this region was flooded by salt Atlantic water, which by August had greatly decreased in volume; in November very little Atlantic water was found here, and that was of comparatively low salinity. By February, 1904, the inflow into the North Sea had recommenced, but was not then quite so extensive as in May of the previous year. It seems, therefore, that during 1903 the Atlantic inflow underwent a variation with the seasons, with the maximum about March and a minimum about November. This conclusion accords with the surface salinity observations carried out along various routes over the North Sea in this period. While too much importance should not be attached to surface observations considered alone, most of the evidence indicates seasonal variation in the volume of Atlantic water entering the North Sea, the greatest inflow occurring early in the year, probably about March or April.

POST-GLACIAL CHANGES OF ATTITUDE IN THE ITALIAN LAKES.—Mr. Frank B. Taylor (Bull. Geol. Soc. Amer., Vol. XV, 1904, pp. 369–378) presents evidence that the levels of Lakes Maggiore, Como, and Garda formerly stood in different attitudes toward the land from that of the present. This evidence is mainly derived from a study of the delta cones of mountain torrents, the lakes being too narrow, the shores too steep, and the rock too hard for the development of continuous shore-line records;

but in the broad, bulb-like southern end of Lago di Garda he found benches backed by cliffs, evidently wave-cut. Taylor's long experience in the study of the shore lines of higher levels of the American Great Lakes leads one to place entire confidence in his conclusions from the studies in the Italian lake valleys. From his observations he draws the conclusion that, as a result of land-tilting, the lake levels of the present are lower in the north than formerly. The surfaces of these lakes sloped to the south about one foot per mile as compared with their present surfaces. R. S. T.

POLAR.

THE ANTARCTIC.—Mr. E. Pariset has written a comprehensive summary of explorations in the Antarctic regions (*Vers la Terre Polaire Australe*, A. Rey, Lyons, France). The book does not contain the results of the voyage of the Scottish expedition in 1904, nor the detailed scientific results of the other recent explorations, which, in fact, are not yet published. With these exceptions it gives in 134 pages a concise and exact résumé of South Polar enterprises. The first chapter treats of the ideas of the Antarctic continent which prevailed previous to the XIXth Century. The author then sums up the work of the many navigators who visited the South Polar regions in that century, and describes the explorations and the scientific results, as far as they are as yet accessible, of the recent Belgian, German, Swedish, English, and Scotch expeditions, and of Mr. Borchgrevink's investigations in Victoria Land. The final chapter generalizes present information concerning glacial phenomena, meteorology, geology, and life in the Antarctic regions, and the book concludes with a bibliography of the most recent expeditions.

THE TEMPERATURE AT THE POLES.—A useful summary of the facts regarding the temperature of the poles, which have resulted from the meteorological work of recent polar expeditions, is given in the *Annales de Géographie* for July 15. A series of charts shows the mean summer and winter temperatures, so far as these are known, for the north and south polar areas. The lower summer temperatures of the Antarctic than of the Arctic are clearly brought out. The difference is ascribed to geographical conditions, the continental mass around the polar basin of the northern hemisphere being well warmed in summer, and this rise of temperature being felt to the vicinity of the pole. In the Antarctic a band of water encloses a mass of land. During the winter this water prevents the polar cold from advancing northwards; while in summer the water cannot warm the Antarctic area, whose mean temperature always remains low.—(*Scot. Geogr. Mag.*, Dec., 1904.) R. DEC. W.

METEOROLOGY IN THE ANTARCTIC.—At the November meeting of the Royal Meteorological Society, in London, Lieutenant Charles Royds, of the *Discovery*, gave an interesting address on *Meteorological Observing in the Antarctic*, which was illustrated with numerous lantern-slides. Lieutenant Royds was the officer specially charged with the meteorological observations during the recent British National Antarctic Expedition. The ship arrived at her winter quarters on February 8, 1902, and as soon as the water in the bay was frozen the meteorological instruments were set up on the ice. This became, to all intents and purposes, a land station in latitude 77° 50′ S., and observations were carried on there from April 17, 1902, until February 15, 1904, when the ice broke up and allowed the ship to go free. The observations were taken every two hours, those from 8 A. M. to 10 P. M. being taken by Lieutenant Royds, and the night observations being divided between the eleven officers and members of the scientific staff, each one taking a night.

The highest temperatures recorded in each year were 39° on December 26, 1902,

and 42°, also on December 26, 1903. The lowest temperature registered during the stay in winter quarters was −59°.5 on August 20, 1903, while at Cape Armitage, a mile and a half to the south of the ship, the minimum on the same day was −64°.6. The lowest temperature registered at Cape Armitage, however, was −67°.7, at noon on July 19, 1902. The heaviest gale was on July 19, 1902, when for ten hours the anemometer gave a velocity of 85 miles an hour. Blizzards were frequent and added considerably to the difficulties of observing, as the drifting snow choked up the instruments and the screens, and also stopped the self-recording instruments. A peculiarity of the blizzards was the invariable rise of temperature; and they always came from the south and southwest.

It has sometimes been supposed that the sun seldom shows itself in the Antarctic regions. Lieutenant Royds, however, said that this was utterly wrong, as day after day there were most glorious clear skies and continuous sunshine. In proof of this he showed a lantern-slide of three cards from the Campbell-Stokes sunshine recorder, which had traces of 24 hours' continuous sunshine. The effect of the sun on the explorers' faces was very marked. During the winter, from living in artificial light, their faces turned yellow and various other colours, but when they went away sledging, and were out in the sunshine for nine or ten hours every day, their faces turned absolutely brown and their lips cracked, while the skin blistered and in many cases their faces became swollen. Lieutenant Royds said that he had never seen such beautiful and striking examples of every sort of cloud as south of the Antarctic circle. Mirages were common, as were haloes and coronæ, some of which were very beautiful and complicated. Auroræ were not uncommon, but they were not so highly coloured nor so brilliant as those seen in the Arctic region. R. DEC. W.

ISOTHERMS AROUND THE SOUTH POLE.—A comparison of the mean annual temperatures at the English, German, and Swedish Antarctic stations during 1902–03 has been made by W. Krebs in a recent paper in *Das Weltall* (Vol. IV, No. 24), with the result that the average decrease of temperature is found to have been 0.9° (0.5° C.) for each degree of latitude. Applying this value to the results obtained by the five stations in operation in the Antarctic region during the years 1898–1903, the writer of the paper above referred to has drawn approximate isotherms between latitudes 50° and 80° S. These isotherms are drawn for each 7.2° (4° C.) as far as 3.2° (−16° C.), which runs near the 70th parallel, between longitudes 60° E. and 60° W. Parts of the isotherm of −4° (−20 C.) are also drawn, reaching nearly to the 80th parallel. This is a considerable extension of our charted knowledge of Antarctic meteorology. R. DEC. W.

COMMERCIAL GEOGRAPHY.

BUSINESS OF THE KAISER WILHELM CANAL IN 1903–1904.—In the fiscal year ending March 31, 1904, 32,038 vessels of a net tonnage of 4,990,287 passed through Kaiser Wilhelm Canal between the North and Baltic Seas. The traffic was 28 vessels and 416,458 tons larger than in the preceding year. The steam vessels numbered 13,943, the sailing vessels 15,341 and the barges and lighters 2,734. Eighty-three per cent. of the vessels and sixty per cent. of the tonnage were under the German flag, the ships of other nations in order of importance being those of Denmark, Sweden, the Netherlands, England, Russia, Norway, Belgium, and France. For the first time the receipts of the canal were greater than its expenses. Most of the sailing vessels, loaded with timber or lumber for Baltic ports, passed through the Danish straits instead of the Kaiser Wilhelm Canal (*Moniteur officiel du Commerce*, Dec. 29, 1904).

THE SEAL CATCH FOR 1904.—The annual report of the U. S. Secretary of Commerce and Labor, says that during the year ending in August, 1904, 13,128 skins were taken and shipped, of which number 11,132 were obtained on St. Paul Island, and 1,996 on St. George Island. This is a decrease of 6,164 from the number of skins taken in 1903. The decrease was due largely to the reservation of young male seals for breeding purposes and other restrictions upon killing deemed necessary to preserve the life of the seal herd.

An industry pursued incidentally with that of sealing on the Pribilof Islands is that of raising the Blue Fox for its pelt. These animals are fed and cared for as if domesticated. Last winter 471 skins were taken on St. George Island. The proceeds of the skins are applied to the support of the native inhabitants, whose services are utilized in the taking and curing of the pelts.

NEW PORT ON THE RED SEA.—Mr. Corbett, the Financial Adviser of the Egyptian Government, said in his note on the Budget for 1905, that the Suakin-Atbara railroad is being built as rapidly as possible, and that it is hoped to complete it early in 1906. The sum of £E. 150,000 has been set apart for the creation of a maritime terminus for the railroad at Sheikh el Barghout, some 30 miles to the north of Suakin. The new port, the official name of which has not yet been selected, has the great advantage over Suakin of possessing a commodious harbour, easily accessible to ships of heavy draft.

GENERAL.

GEOLOGIC EXPRESSION IN CONTOUR MAPS.—A paper with this title was prepared by Mr. N. H. Darton of the U. S. Geological Survey for the meeting of the Association of American Geographers at Philadelphia. It was mainly descriptive of a text-book now in preparation by the author, describing the development of earth forms and their representation on topographic maps. It is a widely-recognized fact that a knowledge of the geologic conditions under which topographic features are developed is an important aid to the topographer in preparing expressive maps, especially where sketching preponderates over the precise instrumental determination of details. For example, a topographer mapping a drift-covered district should know the conditions under which the characteristic drift topography was developed, in order readily to pick out the salient features and give them proper expression and prominence.

Again, in a region such as the Grand Cañon of the Colorado, where the strata lie nearly horizontal and there are widespread beds of harder and softer rocks in alternating series, a map made without proper understanding of the continuity of the hard bench-making layers and the softer strata that form the talus slopes, would be lacking in expression and not likely to give precise fit when geologic boundaries are added. The topographer who has appreciation of the geology would at once provide for the slight but important differences which arise when the beds cease to be horizontal and have even a slight dip; he will note also important distinctions between the cliffs due to limestone and those due to sandstone. Along many other lines, such as lake shores, glacial erosion in the high mountains, and volcanic products, the topographer understanding the principles of the physical development of these forms, can and does produce more expressive maps, and does so with greater economy than the conscientious sketcher whose method is purely mechanical.

THE INFLUENCE OF CAVERNS ON TOPOGRAPHY.—Prof. Russell (Science, Vol. XXI, 1905, pp. 30–32) has made an exceedingly interesting suggestion concerning a possible influence of caverns on topography, which, so far as the writer knows, is a

new point of possible important significance. While limestones, being usually weak rocks, have commonly been worn down to form valleys between the strata of more resistant nature, there are some instances in which limestones stand up prominently above the surrounding strata. The two cases which he especially mentions are those of the rock of Gibraltar and Mackinac Island in Lake Huron. Russell calls attention to the fact that near Luray, Virginia, there is a low limestone hill, with extensive caverns beneath it, which has been left in relief because so honeycombed with caverns that the rain readily percolated into it, thus preventing the formation of surface streams.

On the surrounding land surface streams were able to gather and mechanically erode, thus lowering the surface. The same explanation is proposed as an hypothesis to account for the presence of the elevations at Mackinac Island and Gibraltar. It will be interesting to apply this explanation to these and other instances and see whether it accounts for all the facts, for if it does we have here a new principle in explanation of topographic forms which will be of far wider application than to the exceptional instances discussed. R. S. T.

U. S. BOARD ON GEOGRAPHIC NAMES. DECISIONS DECEMBER 7, 1904, JANUARY 4 AND FEBRUARY 1, 1905 :

ASHNOLA: river, Okanogan county, Washington (and B. C., Canada; crosses boundary at 120° 20'). (Not Na-is-nu-loh, Ashtnulon, Naisnuloh, Nais-nu-loh, Naisnulho, nor Ashanola.)

BEAR LODGE: mountains: Crook county, Wyoming. (Not Bearlodge.)

CAKEPOULIN: creek, Franklin twp., Hunterdon county, New Jersey. (Not Cakepaulins.)

CENTRAL CITY: town (P. O., R. R. station, and county seat) Gilpin county, Colorado. (Not Central.)

CHEWACK: creek, tributary of Methow River (from the north, mouth at Winthrop), Okanogan county, Washington. (Not Che-wuch Creek, Chewach Creek, Chewak Creek, Chiwak, Chewach, Chewuck, nor North Fork.)

CONCONULLY: lake, Okanogan county, Washington. (Not Salmon.)

* EGG: island near easternmost point of Unalaska, eastern Aleutians, Alaska. (Not Ugalgan nor Ugalgal.)*

ELLEMEHAM: mountain, Okanogan county, Washington. (Not Ellemachun, Ellomachan, nor Mt. Ellemeham.)

* ENGLISH: bay indenting the eastern shore of Unalaska island, eastern Aleutians, Alaska. (Not Samganuda.)*

FRASER: river, tributary from south to Grand River, P. O., and Precinct, Grand county, Colorado. (Not Frazier nor Frazer.)

INDIAN: creek, tributary from south to Bear creek, Clear Creek county, Colorado. (Not South Fork Bear Creek, Roeder, nor Yankee.)

LAKE CLEAR: lake or pond in Harrietstown, Franklin county, New York. (Not Big Clear Pond nor Clear Pond.)

LATAH: creek, Spokane and Whitman counties, Washington, and Kootenai county, Idaho, tributary from S. E. to Spokane River at Spokane. (Not Hangman, Hangmans, Latah and Hangman's, Latah and Hangman, Lau-taw, nor Camas Prairie.)

* NORTH HEAD: cape, the northern point of Akutan island, eastern Aleutians Alaska. (Not Sigak.)*

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* Revision of previous decision.

OLD BALDY: peak in the Santa Rita Mountains, Santa Cruz county, Arizona. (Not Baldy, Mt. Wrightson, nor Santa Rita.)

QUENESKA: island in Shelburne town, off Shelburne Point, in Lake Champlain, Vermont. (Not Hog, Whites, nor White's.)

REED: P. O. and R. R. station, Henderson county, Kentucky. (Not Reads.)

RILLITO: creek, four miles north of Tucson, Pima county, Arizona. (Not Rita.)

ROLLINS: pass, over Front Range (Continental Divide), lat. 39° 56′, Boulder and Grand counties, Colorado. (Not Boulder nor Rogers.)

*ROOTOK: island near west end of Aratanak island, Krenitzin group, eastern Aleutians, Alaska. (Not Aektok nor Root*a*k.)*

SALMON: creek, tributary from the north to Okanogan River, Okanogan county, Washington. (Not Conconully, Conc*u*nully, nor White Salmon.)

SAN ANTONIO: creek or river emptying into the Pacific Ocean three miles north of Purisima Pt., Santa Barbara county, California. (Not Jesus Maria River, Guaymas River, nor Los Alamos.)

SIMON: pond, town of Altamont, Franklin county, New York. (Not Simons, Big Simon, Big Simons, Simonds, nor Big Simonds.)

SINLAHEKIN: creek, tributary from the south to Palmer lake, Okanogan county, Washington. (Not Sinlehekin, Sinlahekim, Waring-Sinlehegan, Waring, Toudes Coulé, nor Sinlahegan.)

SUNSET: island, Colchester town, in Lake Champlain, Vermont. (Not Hog Back.)

VALDEZ: glacier, narrows, port, summit, and town, Prince William sound, Alaska. (Not Valdes.)

VANCE: creek, tributary from north to Bear creek, Clear Creek county, Colorado. (Not Little Bear.)

WHALEBONE: cape between Usof and Three Island bays, on south coast of Unalaska, Alaska.

BERGENFIELD: borough, P. O., and R. R. station, Bergen county, N. J. (Not Bergenfields nor Bergen Fields.)

BRUSTER: town and P. O. on the Columbia river, Okanogan county, Wash. (Not Brewster.)

CHILIWIST: creek, tributary from the N. W. to the Okanogan river, Okanogan county, Wash. (Not Chilliwist, Chiliwhist, Chilliwhist, nor Chilowist.)

ECORSE: river, township, P. O., and R. R. station, Wayne county, Mich. (Not Ecorce, River aux Ecorces, nor Ecorces.)

ESTY: glen, north of Ithaca, N. Y. (Not Estey.)

FACTORY: creek in Wayne and Lawrence counties, Tenn. (Not Factory's, Factor's, nor Factors.)

FALSE BOTTOM: creek in Lawrence and Butte counties, S. D. (Not Falsebottom.)

INDIAN: creek in Wayne and Hardin counties, Tenn. (Not Reinness, Reinse's, nor Reinses.)

KOUGAROK: river, tributary to the Kuzitrin river; mountain; mining district; and mining town; Seward Peninsula, Alaska. (Not Kugruk, Koogrock, Kougrok, Kugrock, nor Kugruk City.)

KUGRUK: river, flowing into Kotzebue Sound, just east of Cape Deceit, Alaska. (Not Swan.)

KUGRUPAGA: river, Seward Peninsula, Alaska, flowing into the Arctic Ocean, at Long. 166° 45′. (Not Kugruk nor Koogrook.)

LOUP LOUP: creek, tributary to the Okanogan river, near Malott, Okanogan county, Wash. (Not Loop Loop, Loop-Loop, nor Looploop.)

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* Revision of previous decision.

PALISADES: township, Bergen County, N. J. (Not Palisade.)

ROGERS: island in Hudson river, Columbia county, N. Y. (Not Rodgers.)

WANNACUT: lake, Okanogan county, Wash. T. 39 N. R. 26 E. (Not Waunakee, Wennacut, Wonacot, Wannacott, Wanicot, Wanacott, Wannicutt, nor Wannicut.)

WEATHERFORD: creek, Wayne county, Tenn. (Not Rutherford, Rutherford's, nor Rutherfords.)

BELLEVIEW: township, Washington county, Missouri. (Not Belview, Bellview, nor Bellevue.)

CHILICOTAL: spring and mountain, Brewster county, Texas. (Not Chili Corte, Chili Cortal, nor Chili Cotel.)

EAST BRANCH CHENANGO RIVER: stream, branch of Chenango river, in Oneida, Madison, and Chenang counties, NewYork. (Not East Chenango River nor Chenango Creek.)

KENNYETTO: creek, Fulton county, New York. (Not Kenneto.)

MOUNT VERNON: P. O. and town, Hillsboro county, New Hampshire. (Not Mt. Vernon nor Mount Vernon.)

SAN CRISTOBAL: lake, Hinsdale county, Colorado. (Not San Cristoval, nor San Cristopal.)

STASER: P. O. and R. R. station, Vanderburg county, Indiana. (Not Stacer, Stacers, nor Stasers.)

The Board on Geographic Names was constituted by Executive Order of September 4, 1890, and its decisions are accepted by all the Departments of the Government; now and again to the surprise of mankind. None the less, there are bounds to authority, and it is not easy to believe that the Attorney-General or the Secretary of State will write *Belleview* for *Bellevue*, out of deference to the Board.

(EDITOR BULLETIN.)

OBITUARY.

ADMIRAL SIR ERASMUS OMMANNEY.—This well-known Arctic explorer died in England in December last. He was born in 1814, entered the navy in 1826, and was promoted to the rank of captain in 1846. In 1850–51 he commanded the *Assistance* in the Arctic search expedition under Capt. Horatio Austin, and discovered on Aug. 25, 1850, the first traces of Sir John Franklin, which proved that his ships had wintered at Beechey Island. He also directed an extensive system of sledge journeys, by which the coast of Prince of Wales Land was laid down.

DR. A. M. STÜBEL.—This explorer, ethnologist and geologist, who was especially well known through his studies in vulcanology, died in Dresden on November 10 last. He was sixty-nine years old.

NEW MAPS.

AMERICA.

UNITED STATES.—Geologic Atlas of the United States.

No. 113. Huron Folio. South Dakota. Area, 857 square miles. Between parallels 44° and 44° 30′ N. Lat., and meridians 98° and 98° 30′ W. Long. Scale, 1:125,000, or 1.9 statute mile to an inch. Lies in the valley of the James River, which has a general southward course across the eastern half of the quadrangle. The region is flat and its features are those of subdued glacial topography, the basins being shallow and far apart and the swells very low. All the streams belong to the